REMARKS

Claims 1-4, 8, 11, 20, 22, 27, 28 and 31-34 are pending.

Referring to pages 3-12 of the Office Action, claims 1-4, 8, 11, 20, 22, 27-28 and 31-34 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 4,218,306 ("Gross") in view of U.S. Patent No. 6,416,656 ("Zhang").

Applicants traverse and respectfully request the Examiner to reconsider. The process according to the present claims is patentable over Gross in view of Zhang for *at least* the following reasons:

(a) Gross is related to ***increasing the yield of gasoline*** in an FCC process, while limiting the riser location level from ***10 to about 30*** feet above the bottom (which is essentially equivalent to from about 6 to 30% of riser height) for the injection point of the more refractory feed for cracking. In this regard, one of ordinary skill in the art would appreciate that when ***the volume*** of the secondary feed is increased, the level of injection of secondary feed becomes more restricted and, consequently, the process becomes limited to a low ***amount of secondary feed*** (an amount equivalent to about 4%wt).

Zhang is related to simultaneously increasing the yields of diesel oil and LPG (liquefied petroleum gas), wherein a gasoline stock, an ***optional pre-lifting medium*** and a catalytic cracking catalyst are charged into the reactor, ***in the bottom of the reactor***, in order to produce an oil-gas mixture. In the process according to Zhang, the gasoline stock injected into the reactor ***can substitute*** completely or partially for the pre-lifting steam. (*See* Zhang at 8:4-11.) This oil-gas mixture (the weight ratio of the pre-lifting medium to gasoline stock is 0-5:1) flows upwardly in the reactor and then contacts a ***conventional*** catalytic feed introduced from at least two sites along the reactor, to produce an oil-gas mixture with a lot of diesel oils.

It would have been readily apparent to one of ordinary skill in the art that this ***optional*** pre-lifting medium can be used to ***reduce the residence time*** by helping to carry the distillate oils upward in a riser reactor. However, no dry gas or pre-lifting medium is required to be injected together with gasoline stock for feed dispersion.

In contrast, the present claimed invention is not directed to the production of diesel oil or gasoline. Further, the present application is completely silent with regard to the use of a pre-lifting medium comprising a lower molecular weight hydrocarbon feed (admixed or not) with dry gas or steam. In addition, the present claimed invention does not lead to an increased gasoline yield by quenching for the reduction of thermal cracking, as taught by Gross.

Therefore, Applicants submit that the teachings of Gross and Zhang, taken separately or together, would not even suggest to one of ordinary skill in the art the cracking process recited by the present claims.

(b) In this respect, the present claimed invention is directed to the FCC (fluid catalytic cracking) of mixed feedstocks, namely feed A and feed B, at simultaneous and segregated injection points, using overall catalytic cracking conditions aimed at ***increasing the conversion into LPG at the expense of gasoline GLN***. In the recited process, both feeds are conventional FCC feedstocks, feed B being more refractory to cracking than feed A. The claimed process allows LPG to be recovered in a higher amount than the amount that would have been obtained if feed A and feed B were both injected into the base of the riser reactive section. Indeed, the segregated ***total injection of feed B has to be at an injection point downstream of feed A, at a higher temperature and in a high dispersion degree.***

Imparting a high dispersion degree to feed B may reduce the residence time of feed B in the riser reactive section, this being less favorable to the process of cracking feed B that is more

refractory than feed A. Thus, the segregated injection of feed B can be provided farther up the riser reactive section (80%) because of the recited combination of temperature and dispersion conditions. This enables the flexibility of the presently recited process.

Again, the research carried out by Applicants has indicated that feed B is to be injected, downstream of feed A, in one or more riser locations on specific injection temperature as well as optimized dispersion conditions. (*See* specification at p. 22, ll. 14-21.) Further, the optimized injection of feed B may require a high-efficiency device for feed dispersion besides an optimum CTO (catalyst to oil ratio), a higher injection temperature than feed A and an optimum dispersion stream, all in combination.

(c) Tables 3A and 3B of Example 2 provide evidence of the injection conditions of feed B aimed at ***compensating the lower residence time*** resultant for cracking feed B along the reactor by a ***better dispersion of feed B*** in the injection. (*See* specification at pp. 24-26.) In view of Example 2, it is clear that an increased dispersion stream (*see* Case 4 as compared to Case 5, wherein the dispersion stream was increased from 5%wt to 10%wt) leads to an unexpectedly increased conversion into LPG at the expense of gasoline GLN. In addition, unexpectedly superior results in LPG production were obtained by increasing the temperature (*see* Case 5 as compared to Case 7, wherein a 10%wt of dispersion stream was maintained as the temperature was increased).

Thus, from these examples, one of ordinary skill in the art would appreciate that a ***dispersion of feed B within the recited amount allows feed B to be injected at a higher position in the riser***. Otherwise, despite an increase in the LPG production of feed A, the net result at the end of the riser could be upset by the inadequate cracking of feed B. The cited references fail to even suggest this result to one of ordinary skill in the art.

When the recited conditions are employed in a cracking process, an increased LPG production with optimized CTO can be obtained, as demonstrated by Tables 2A and 2B of Example 1. (*See* specification at pp. 23-24.) In this Example, higher yields of LPG were obtained when feed B was injected at an injection position at 50% of the riser height and, in addition, this injection point provided a better temperature profile (*see* Fig.1) for cracking because a large portion of the riser operated at higher temperatures, without CTO variation.

In view of the above, one of ordinary skill in the art would understand that an increased conversion to valuable products, mainly LPG, is observed as a result of the recited combination of conditions, which includes a suitable injection temperature and dispersion degree of feed B.

In addition, as can be seen in Tables 2A and 2B, the increased LPG yield is a consequence of the maximum LPG production of A in the length of the reactive section corresponding to the optimum residence time for cracking A, and is also a consequence of specific conditions to maximize LPG production for cracking B, which is injected preferably between 25 to 50% of the riser height that corresponds to 30 to 55 feet of a typical riser with a height of 110 feet.

In light of the above, reconsideration and withdrawal of the Section 103 rejection of claims 1-4, 8, 11, 20, 22, 27-28 and 31-34 based on Gross in view of Zhang are respectfully requested.

Reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the local, Washington, D.C., telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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